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Where do tires
come from?

Special Edition Three

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Where do tires come from



In the last six issues, we've taken an insider's look at how Bridgestone tires are made, examining the process from every angle. But we missed a step. The first one. So before we close this chapter, let's rewind to the beginning of the story. Where do tires come from? How are they conceived?

A new tire starts as an idea on "the drawing board." And just as we've seen throughout every step of the process, the idea or product doesn't move forward unless it's been tested and evaluated. We spoke with David Gatten, manager of product planning at Bridgestone to learn more.

How does the process start?

“We get together to talk about what’s going on in the industry. It’s more formal than that, but essentially, it’s about people from various Bridgestone departments who meet on a regular basis to share information from fleet customers, sales managers, sales engineers, the trucking industry, original equipment manufacturers, and others.

“Conversation is centered on the fleet customers, who of course, are quite diverse. Bridgestone truck and bus customers run just about every kind of truck, bus and trailer combination, on every kind of road, with every type of haul imaginable. This obviously impacts tire choices.”

Are most ideas for new tires generated from customer needs?

“Meeting customer needs is the biggest reason Bridgestone introduces new tires.

“But the committee may decide a new tire isn’t necessary – Bridgestone may have a great tire that already exists and is ideal for the job. But there’s a stumbling block: It’s not available in the right size for customers’ trucks. So the group will recommend adding sizes to the existing product line and order new molds to be built.

“In about eight to ten months, the tire can be tested and manufactured, and a healthy supply of the new sizes delivered to our dealers and truckstops and, ultimately, to our fleet customers.”

Even existing tires are tested?

“Sure. We inspect the new molds. We test to make sure the proper materials are being used. And we test to make sure everything in the manufacturing process is correct.”

What are other reasons why a tire is introduced?

“Every product has a lifecycle. Some are long and the product will be in the marketplace a long time, others are relatively short.

“The premium steer tire market is extremely competitive and, therefore, has a relatively short lifecycle. Bridgestone introduces new, improved tires as new technology is developed.”

Bridgestone just introduced the R287 steer tire in spring 2004.

“And we’re already in the process of developing its successor.”

What is that process?

“The group takes a look at attributes of the current tire. Then we ask ourselves, ‘Where do we want to be?’

“For example, the R287 has extraordinary irregular-wear-fighting abilities. Can Bridgestone engineers improve wear?

“The R287 has exceptional removal mileage. What new technologies can increase removal mileage even farther?

“The group lists the performance milestones they want the new tire to achieve. Milestones could include irregular wear-resistance, removal mileage, traction, cut and chip resistance, stone drilling resistance, handling, etc.

“The committee then sets specific objectives for the new tire. For example: Increase removal mileage 20 percent; improve traction 10 percent. We also rank these objectives so everyone involved understands which priorities must be met. Goals further down the list are negotiable.”



No matter how thorough the procedures are in the lab, nothing compares with real-world tests of prototype tires.

What could be negotiable?

“If we want one thing, we must ask ourselves, ‘How much?’ If we demand a dramatic increase in, for example, removal mileage, it could be at the expense of something else – a trade-off. We need to be prepared to negotiate the consequences of our demands.”

Does the committee also decide which product features should be on the tire?

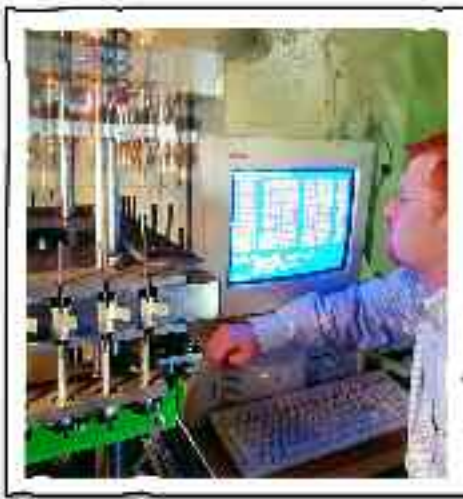
“The development group decides on new features, such as sidewall protectors, Equalizer Rib™ structures, Side Groove™ technology or stone rejector platforms, based on two reasons: a means of reaching our performance targets and customer input.”

What do you mean by customer input?

“What are customers talking about? What do drivers want? What’s the latest technology that’s making an impact? What’s the competition doing? What are people doing differently that might require a new solution? It’s why



It takes an “eagle eye” to spot a prototype tire that’s being evaluated on a volunteer transport fleet. The only marking on the sidewall of this tire is the internal code name, “S198Z.”



Throughout every step of the process, new product ideas don't move forward unless they've been analyzed and approved by people like these engineers at the Akron Technical Center.

the #5-ranked objective but severely falls short of another, the group will examine the results and re-evaluate the objectives.”

What kinds of evaluations are performed by the engineers?

“Tech center and sales engineers perform experiments both in and out of the lab. Several fleets volunteer to run prototype tires on their trucks so engineers can test and evaluate in real-world conditions.”

it's so important Bridgestone has a development committee that gets together, face to face and talks about what's **really** going on in the field.”

So what's next?

“The new tire is assigned to one of our global tech centers. If it's a totally new concept or will be used in other parts of the world, the Bridgestone Technical Center in Tokyo gets the job. Otherwise, product development is assigned to the Akron Tech Center.”

And then what?

“That's when engineers turn our ideas into brand-new tires.

“Using new technologies in rubber compounding and tread patterns, research and development engineers work to build a tire that meets our performance objectives – what we want our tires to achieve.

“By the way, the development committee rarely surprises the engineers at the Akron Tech Center – they're pretty tuned in to us. They anticipate what we will ask for – and are already working on ways of achieving our objectives.

“When the engineers are finished, they present the prototype to the development committee.”

What does the development committee look for?

“Performance test data results. As the engineers at the tech center were developing the new tire, they were also thoroughly evaluating its overall capabilities.

“The results of the data indicate if the new tire is meeting its performance objectives.”

What if it doesn't?

“It depends on which objective was not met. If the #1 ranked performance objective is a 20 percent improvement in mileage removal, and the prototype is projected to reach 18 percent, we'll ask the tech center to continue working until the tire achieves 20 percent.

“If it's an objective further down the list, we'll talk about why it wasn't met. Earlier we discussed trade-offs, and meeting our benchmark of one thing could be at the expense of another. If results indicate the tire almost meets

How long does testing last?

“It depends. Analyzing steer radials, for example, could take eight to ten months, depending on the percentage of wear. Checking trailer radials, because of slower rates of wear, could very well take two years. Rather than hold up product introduction for two years, the development committee may evaluate the prototype at only 50 percent wear instead of at removal, so testing takes just one year.”

During the first trial run, the plant will produce about 10 tires for evaluation.

This example is an old R287 that was cut apart so plant engineers could check to ensure the materials and manufacturing processes being used were right.

Typically these “slices” are made to measure size, shape and position of components.



What happens next?

“The committee approves the prototype, the Tech Center finalizes specifications and drawings, then new molds are ordered. New molds cost about \$75,000 each and take about three to five months to build.

“When the molds are finished and shipped to the factory, the manufacturing plant builds a very small quantity of tires. The tires are cut apart and analyzed. Sometimes, the design specification is tweaked two or three times before everyone is satisfied it is just right.”

Is it a brand-new tire now?

“Yes. In about two months, you can find Bridgestone's brand-new tire at your favorite dealer or truckstop.” **TA**